

ANEQ 581A5 - ADVANCED MEAT SCIENCE

3 credits

Department of Animal Sciences

Colorado State University

Spring 2018

Meeting Time T, R 9:30-10:45 a.m., Location: Room 33

Instructor Dr. Mahesh N. Nair
Office: 054 Animal Sciences
Phone: 491-5622
E-mail: mnair@colostate.edu

Course Description

Advanced study of fundamental and biochemical basis of meat quality.

Course Objective

This course offers a unique opportunity to explore, in-depth, the biochemical and molecular basis of meat quality, cellular events that happen during the conversion of muscle-to-meat and its effects on meat quality. At the conclusion of this course, students should have an in-depth knowledge of the biochemistry and biology associated with muscle as a food.

Prerequisites: ANEQ 360/470 or Approval of the instructor

Student Learning Outcomes

- Students will be able to comprehend, interpret, and apply the biochemical basis of meat quality and events related to muscle-to-meat conversion.
- Students will be able to search, comprehend, summarize, appraise, and present research in meat science.
- Students will be able to create, design, organize, and evaluate research in meat science.

Grading System

Exam # 1	17.5%
Exam # 2	17.5%
Exam # 3	17.5%
Final Exam	17.5%
Journal Discussion/Write-ups	15%
Proposal and Presentation	15%

Grade	Percent
A	90-100
B	80-89
C	70-79
D	60-69
E	<60

Exams: The exams, including final exam, will **NOT** be cumulative. However, students are expected to recall and retain concepts and topics covered in previous sessions. Exams will cover course materials discussed in the class, handouts, and other topics covered in class. Exam questions may consist of multiple choices, matching the appropriate, true or false, short answers, and essays.

Tentative exam dates

Exam # 1	- February 08, 2018
Exam # 2	- March 06, 2018
Exam # 3	- April 05, 2018
Final Exam	- May 10, 2018 (2.00 – 4.00 pm)

Make-up Exams: Make-up exams will **only** be given if the instructor approves them before the exam. If the student happens to miss any exam due to excused absence, it is the student's responsibility to set-up an alternate time for the exam. Exams will not be rescheduled for unexcused absences.

Journal Discussions: Multiple journal articles will be distributed in class or through canvass to complement topics covered in lectures. The purpose of this is to get students familiarized with recent research and advances in meat science. For each of the articles, students are expected to provide a single page critical review. These reviews will be checked for plagiarism. Active participation from students are expected while discussing them in the class.

Proposal and Presentation: The course will include a two-page research proposal (single spaced with 1 inch margins using a 12-point font size excluding the budget and references) to address a meat quality issue. It should have the following sections 1. Introduction 2. Justification 3. Experimental approach 4. Anticipated results 5. Potential pitfalls. The proposal will be peer-reviewed by the class and students are expected to give a 20 min presentation based on the proposal. The title of the proposals are due on **March 20, 2017**, and the full proposals are due on **April 17, 2017**. This will be followed by student presentations.

The following criteria will be used to evaluate your written proposal:

- Novelty – To ensure that the proposal is novel, a thorough search in different computer based search engines is strongly encouraged. If the instructor is able to find that same/similar research has been published before, and that it has not been addressed appropriately in the proposal, half of the total points will be deducted.

- Presentation, organization and interpretation of existing information.
- Reference section (in addition to two-page proposal). All references should be listed in *Journal of Animal Science* format.
- Neatness and grammar.

Textbook

There is no textbook for the course. The majority of the lecture material will be available on Canvas. Other relevant readings related to the course will be posted on Canvas or distributed through emails.

Academic Integrity: Please refer to General Catalog section “Academic Integrity/Misconduct” and the Student Conduct Code.

Tentative lecture topics

1. Amino acids, protein chemistry
 2. Muscle proteins, ultra-structure
 3. Muscle fiber types
- EXAM I**
4. Protein functionality
 5. Carbohydrates - structures, properties, glycogen
 6. Muscle to meat conversion, glycolysis/ glycogenolysis, chilling, electrical stimulation
- EXAM II**
7. Water, water holding capacity; PSE/DFD
 8. Lipids – classification, structures, oxidation, antioxidants
 9. Meat color; Modified atmosphere packaging
 10. Mitochondria
- EXAM III**
11. Cooked color
 12. Tenderness
 13. Mass spectrometry, proteomics, and metabolomics
- FINALS**

Syllabus and topics are subject to change. If you are absent from the class, it is your responsibility to check on announcements made while you were absent.